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UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE  
INSECTICIDE DIVISION

Patent List No. 45

A LIST OF  
UNITED STATES PATENTS  
Issued from 1917 to 1933 inclusive  
relating to  
APPARATUS FOR DESTROYING SMUT ON GRAIN  
Compiled by  
R. C. Roark

Washington, D. C.  
April 1935







A LIST OF UNITED STATES PATENTS ISSUED FROM 1917 to 1933, INCLUSIVE  
RELATING TO APPARATUS FOR DESTROYING SMUT ON GRAIN

Compiled by

R. C. Roark

Insecticide Division, Bureau of Entomology and Plant Quarantine.

The 77 patents included in Patent List No. 45 describe apparatus for treating grain with solutions, dusts or gases containing copper sulphate, copper carbonate, lime, formaldehyde, hypochlorite, sulphur dioxide, or other fungicides for destroying smut and other fungal and bacterial diseases.

Every effort has been made by the compiler to make this list of patents complete and no discrimination is intended against any patent mention of which is inadvertently omitted.

The Department of Agriculture assumes no responsibility for the merits or workableness of any of the patents, nor does it recommend any of the inventions listed.

1,211,734 (Jan. 9, 1917; appl. June 29, 1915). SMUT-MACHINE. Clarence McKinney, Amherst, S. Dak. - A machine for treating grain with a chemical solution to destroy smut and other disease germs is described.

1,218,114 (Mar. 6, 1917; appl. Mar. 28, 1916). GRAIN-TREATING APPARATUS. Miles E. Pearson, Pullman, Wash. - An apparatus for heating grains in water mixed with germ killing ingredients for the elimination of smut is described.

1,218,250 (Mar. 6, 1917; appl. July 3, 1915). GRAIN-PICKLER. John Fox, Wolseley, Saskatchewan, Canada. - This invention is a grain pickling apparatus for use in destroying the germs of smut by thoroughly sprinkling the grain and mixing the same with a suitable germ destroying solution.



1,221,636 (Apr. 3, 1917; appl. Mar. 3, 1916). PROCESS OF CLEANING WHEAT AND OTHER GRAINS. Arnold C. Von Hagen, Kansas City, Mo. - A process of treating grain to remove oil, smut, etc., consists in subjecting the grain to the action of a dry alkali, preferably lime, in the presence of a quantity of liquid insufficient to dissolve the alkali and applied to the grain separately from the alkali, said liquid operating to moisten the alkali, and bring the same into intimate contact with the surface of the grain.

1,231,002 (June 26, 1917; appl. Feb. 25, 1915). WHEAT WASHING, RINSING, AND DRYING MACHINE. Charles Dawson, Tacoma, Wash. - This invention relates to machines for washing wheat to free it from smut and other impurities therein.

1,234,305 (July 24, 1917; appl. Jan. 8, 1917). GRAIN-PICKLING DEVICE. Emile Dolter, Sintaluta, Saskatchewan, Canada. - This device not only treats the grain for smut but also removes any wild oats which may be in the grain.

1,237,425 (Aug. 21, 1917; appl. Sept. 1, 1916). METHOD OF TREATING WHEAT. - Arnold C. Von Hagen, Kansas City, Mo. - This invention relates to a method of treating grains, and more particularly wheat, to controllably supply moisture thereto and to improve the color of the flour content of the grain. It may be practised independently of any other treatment, but preferably it is designed to follow as an added step in a continuous process the treatment of the grain with an alkaline substance, or a hypochlorite, or both, to sterilize, clean and purify the same.

1,244,761 (Oct. 30, 1917; appl. Feb. 1, 1917). GRAIN-PICKLING MACHINE. Charles H. Nelson, Vulcan, Alberta, Canada. - A machine for the treatment of grain to eradicate smut, rust and like diseases is described.

1,254,008 (Jan. 15, 1918; appl. May 10, 1916). WHEAT SCALPING AND CONDITIONING MACHINE. Joseph H. Heishman, Port Huron, Mich. - A mechanism for eliminating the undesirable berries and extraneous matter such as garlic and smut and for properly conditioning the wheat is described.

1,260,606 (Mar. 26, 1918; appl. Dec. 22, 1916). MACHINE FOR TREATING GRAIN. Thaddous C. Walstad, Marmon, N. Dak. - A machine for treating wheat, oats, and the like with formaldehyde solution to control smut is described. This is to be used in connection with the usual fanning mill.

1,264,438 (Apr. 30, 1918; appl. Apr. 17, 1917). GRAIN-PICKLER. Raymond Rasmussen, Regina, Saskatchewan, Canada. - This invention facilitates destroying smut, rust and like germs which usually affect grain, permitting of the grain being thoroughly and uniformly sprinkled with a germ destroying solution.



1,265,700 (May 7, 1918; appl. Sept. 1, 1916). PROCESS OF TREATING WHEAT AND OTHER GRAINS. Arnold C. Von Hagen, Kansas City, Mo.- For the purification of wheat from smut, rust, bacteria, etc., a combination of an alkali and a suitable halogen-containing sterilizing agent is employed. Calcium hydroxide is the preferred alkali, and calcium hypochlorite the preferred sterilizing or germicidal agent. In some cases, the hypochlorite may be used alone, 1 part to 250-1000 parts of water. The mixture is employed preferably by mixing the dry lime with the wheat in the proportion of 1/8 to 1 ounce of lime per bushel of wheat, then moistening the grain with the hypochlorite solution. Chlorine water may be used in place of the hypochlorite solution.

1,274,180 (July 30, 1918; appl. Oct. 9, 1917). GRAIN-TREATING MACHINE. Wilhelm Mauch, Jr., Zeeland, N. Dak. - A machine for treating grain, and especially wheat, with chemicals, such as vitriol or formaldehyde for the purpose of preventing smut is described.

1,275,819 (Aug. 13, 1918; appl. Mar. 6, 1916). GRAIN-PICKLING MACHINE. Elsie Wright, Condon, Ore. - This machine is provided with means whereby a pickling solution is thoroughly mixed with the grain in transit, and whereby the flow of grain may be regulated in proportion to the flow of liquid.

1,279,791 (Sept. 24, 1918; appl. Jan. 22, 1917). AUTOMATIC GRAIN-PICKLER. Henry Uiting, Carlyle, Saskatchewan, Canada. - It is the object of this invention to provide a machine for pickling grain which will insure a perfect mixture between the grain and the pickling liquor, even where the lightest grains, e.g. oats, are passed through the apparatus.

1,293,034 (Feb. 4, 1919; appl. Feb. 11, 1918). SEED-TREATING APPARATUS. William S. Chambers, Coeur D'Alene, Idaho. - A device for treating grain seed, such as wheat, oats and the like, with a germicide (e. g. vitriol) to eliminate smut is described.

1,297,684 (Mar. 18, 1919; appl. July 30, 1917). PROCESS FOR TREATING STANDING GRAIN. Johannes Hanson, Montevideo, Minn. - A process of treating standing grain consists of removing dew from the growing stalks of grain, at a time when conditions are suitable for the development of plant rust on said grain, by traversing the grain field, successively bending the stalks earthward and releasing them permitting sudden return of the grain stalks.

1,312,647 (Aug. 12, 1919; appl. May 6, 1918). MACHINE FOR TREATING SMUT. Alfred Struble, Fargo, N. Dak. - One-half to Alfred Hoiland, Fargo, N. Dak. - A device for dipping vegetable products, such as potatoes, wheat, barley or the like, to bring about the destruction of smut, scab, scale, etc., is described.

1,313,027 (Aug. 12, 1919; appl. Mar. 24, 1917). GRAIN-TREATING APPARATUS. Lonious D. Smith, Helix, Ore. - An apparatus for treating grain or other seed with copper sulphate solution is described.



1,324,048 (Dec. 9, 1919; appl. May 6, 1918). METHOD AND APPARATUS FOR BLEACHING GRAIN. Harold H. Hicks, Milwaukee, Wis. - Donahue-Stratton Company, Milwaukee, Wis. - Grain is bleached to remove impurities and foreign matter such as stains, mold, dust, smut and bacteria by subjecting it to the action of fumes from burning sulfur as the grain descends through a stack. The grain is subsequently treated with steam after leaving the stack.

1,324,312 (Dec. 9, 1919; appl. Jan. 7, 1919). MACHINE FOR TREATING SEED-GRAIN. Wenzel H. Herrmann, Norheim, Mont. - A machine is described for thoroughly agitating and coating seed with formaldehyde or other treating liquid.

1,327,444 (Jan. 6, 1920; appl. Mar. 22, 1918). GRAIN-PICKLER. Francis L. Phillips, Tugaskie, Saskatchewan, Canada. - A device in which the flow of grain may be accurately regulated and spread uniformly in contact with a pickling solution to insure the grains being thoroughly washed is described.

1,344,148 (June 22, 1920; appl. Oct. 10, 1919). GRAIN-PICKLER. Arthur E. Rockola, Sandford Deen, Saskatchewan, Canada. - This invention provides efficient means for thoroughly moistening and mixing the grain with a suitable solution, such for instance as formalin.

1,363,053 (Dec. 21, 1920; appl. May 1, 1920). GRAIN-TREATING SUPPLY-TANK. John O. Pierson, St. John, and Earl M. Pierson, Albion, Wash. - Grain is delivered to a hopper, whence it is conveyed in a treating solution so as to prepare the grain for seeding purpose or the market, and finally the treated grain is elevated and discharged into sacks or bags, the sacks or bags being held in a novel manner so that any treating solution carried by the grain into the sacks can be returned into the machine thereby avoiding any waste of the treating solution, the grain during treatment being relieved of the smut germ, and also thoroughly cleaned.

1,371,913 (Mar. 15, 1921; appl. Feb. 20, 1920). GRAIN-PICKLER. Ezra N. Leizert, Saltcoats, Saskatchewan, Canada. - A machine is described by the use of which grain can be quickly and effectively treated for smut and like undesirable growth and arranged so that there is practically no loss of the pickling solution and such that the complete operation can be carried on by one man.

1,372,511 (Mar. 22, 1921; appl. July 8, 1916). SCOURER. Charles T. Howson, Owensboro, Ky. - Anglo-American Mill Co., Owensboro, Ky. - A grain scouring machine is described in which all collections or accumulations of dust or other foreign matter which might collect vermin or various other forms of fungi [sic], resulting in contamination of the stock, is prevented.



1,377,743 (May 10, 1921; appl. May 31, 1919). APPARATUS FOR TREATING GRAIN OR THE LIKE. Paul V. Austin, Buffalo, N. Y. - An apparatus for treating seed, grain or the like with formaldehyde solution or other disinfectant in the form of a fine spray to destroy the spores of injurious fungus growths is described.

1,382,981 (June 28, 1921; appl. July 8, 1919). GRAIN-TREATING MACHINE. Ludvig A. Iversen, Lankin, N. Dak. - A device for treating grain with a cleansing fluid such as formaldehyde mixture to remove smut and eliminate smutty grain in the resultant crop is described.

1,392,649 (Oct. 4, 1921; appl. Feb. 6, 1920). GRAIN-TREATING MACHINE. Henry Labak, Minneapolis, Minn. - Grain which has deteriorated, during storage in damp places or while containing moisture, is treated in this machine with a liquid to destroy smut, etc., such as formaldehyde solution.

1,396,621 (Nov. 8, 1921; appl. Apr. 16, 1921). MACHINE FOR TREATING GRAIN, ETC. Harold L. Breen, Hatton, N. Dak. - A machine for treating grain, potatoes, and vegetables with a solution, for instance, formaldehyde, for the purpose of destroying disease germs carried by these products of the soil is described.

1,400,664 (Dec. 20, 1921; appl. Oct. 18, 1920). GRAIN-WASHING MACHINE. Charles Dawson, Tacoma, Wash. - This invention relates to machines for washing and scouring wheat to free it from smut and other impurities in order that it will be suitable for food making purposes.

1,403,092 (Jan. 10, 1922; appl. Aug. 13, 1919). GRAIN-WASHING MACHINE. Carl P. Miller and Ralph R. Leo, Fargo, N. Dak. - A machine for removing smut from grain as well as also removing foreign seeds therefrom is described.

1,409,144 (Mar. 7, 1922; appl. May 12, 1920). METHOD OF DRY-PICKLING SEED GRAIN. Albert A. Lawrence, Regina, Saskatchewan, Canada. - John Fox, Regina, Saskatchewan, Canada. - Grain in a wagon grain box is fumigated by heating a cake of formaldehyde over a wood alcohol burner in a suitable apertured vessel which is surrounded and covered over with the grain. The body of the grain in the wagon grain box may be covered over with a blanket to retain the gas.

1,458,854 (June 12, 1923; appl. July 1, 1922). SEED AND POISON POUCH. Joseph M. Saladiner, Bryan, Tex. - This device is a combined scoop and sifter, and is particularly useful for sifting out seed and the like which has been treated with poisonous powders.

1,473,165 (Nov. 6, 1923; appl. Dec. 4, 1922). SEED-CONDITIONING APPARATUS. Frederick Steigmeyer, Westhaven, Calif. - It is the purpose of the present invention to aerate grain or other seed before planting or to dust the same with a suitable material, such as copper carbonate, to prevent parasitic diseases, bacteria, fungus or the like; to serve as a repellent to insects or other pests; to destroy eggs and larvae of parasites which may be or later appear on the seeds or in the immediate



vicinity thereof; to introduce into the soil in the immediate vicinity of the places where such treated seeds are planted such material as will destroy or render harmless to seed germination and plant life parasites and the like; and to deposit material on seeds to stimulate germination and invigorate root and plant life.

1,479,764 (Jan. 1, 1924; appl. May 3, 1922). MACHINE FOR TREATING SMALL GRAIN. Max A. Wheeler, Lind, Wash. - A machine for treating grain with a liquid for the prevention of smut is described.

1,498,379 (June 17, 1924; appl. Mar. 27, 1923). SEED-TREATING MACHINE. Emil B. Jahn, Downs, Wash. - This machine is designed to coat seed wheat or other seeds with copper carbonate or other desirable chemical.

1,509,280 (Sept. 23, 1924; appl. Sept. 13, 1923). APPARATUS FOR TREATING GRAINS AND ORGANIC MATTER. Robert E. Baker, Pittsburgh, Pa., and Harry W. Jordan, Syracuse, N. Y. - The patentees claim in a sterilizing heating unit, the combination of a main upright cylinder adapted to be filled with a column of grain, means for heating said cylinder for raising the temperature of the grain sufficiently to destroy the eggs of insects and fungus, means for effecting the gravitation of the column of grain from the cylinder at different speeds, and means for passing heated air upwardly through the grain of said column. A suitable apparatus is described.

1,550,656 (Aug. 25, 1925; appl. Apr. 9, 1923). GRAIN-TREATING MACHINE. Roy M. Anderson and Harry Y. Anderson, Walla Walla, Wash. - This machine is adapted for treating grain with a dry, powdered fungicide.

1,558,580 (Oct. 27, 1925; appl. June 18, 1925). APPARATUS FOR PICKLING AND/OR MIXING GRAIN AND FOR OTHER ANALOGOUS PURPOSES. Alfred J. Bishop, Melbourne, Victoria, Australia. This apparatus is designed for treating grain with copper carbonate, copper sulphate or other suitable dry, powdered material to destroy ball smut or bunt.

1,573,142 (Feb. 16, 1926; appl. June 28, 1923). MACHINE FOR TREATING SEED GRAIN. Claude C. Calkins, Spokane, Wash. - This device coats seed grain, such as wheat, with powder (e.g. copper carbonate) to prevent disease or fungus growth, such as smut.

1,573,340 (Feb. 16, 1926; appl. Apr. 23, 1923). GRAIN-TREATING MACHINE. Samuel A. Weitman, Kahlstus, Wash. - A machine for treating seed grain with copper-carbonate or other desired fungicide, for the purpose of preventing the so-called "bunt" or "stinking smut" is described.

1,573,694 (Feb. 16, 1926; appl. Feb. 21, 1924). GRAIN PICKLER AND LOADER. Alfred Espeseth, Prosper, Alberta, Canada. A structure which may be used simultaneously for pickling grain and loading the same in a wagon or the like is described.



1,593,174 (July 20, 1926; appl. Oct. 3, 1925). METHOD OF AND APPARATUS FOR WASHING GRAIN. Robert G. Hunt, Astoria, Ore. - Wolf Company, Chambersburg, Pa. - A method of and apparatus for washing grain so as to break up and remove smut balls therefrom as well as to remove other deleterious substances is described.

1,616,783 (Feb. 8, 1927; appl. Aug. 16, 1926). MACHINE FOR TREATING GRAIN. Claude C. Calkins, Spokane, Wash. - This machine is intended for applying a coating of powdered copper sulphate or other suitable material to grain to combat disease, such as smut.

1,623,001 (Mar. 29, 1927; appl. July 19, 1926). MACHINE FOR TREATING GRAIN WITH COPPER CARBONATE. Joseph Gollbach, East Nicolaus, Calif. - A machine for treating grain with copper carbonate for sowing purposes is described.

1,625,521 (Apr. 19, 1927; appl. Sept. 26, 1925). GRAIN-MIXING AND CHEMICAL-TREATING MACHINE. Orr Burgett, Scobey, Mont. - A machine for mixing grain, feed, and the like, and treating said grain and feed with chemicals is described.

1,629,050 (May 17, 1927; appl. Nov. 24, 1925). APPARATUS FOR TREATING GRAINS. Louis J. Puls, Walla Walla, Wash. - This apparatus is designed to treat grain with a powder to prevent deterioration before or after planting. This treatment immediately follows the cleaning of the grain.

1,630,308 (May 31, 1927; appl. Dec. 10, 1926; in Argentina Sept. 25, 1926). APPARATUS FOR DRYING, CURING, VENTILATING, OR OTHERWISE TREATING GRAIN OR THE LIKE. Anibal J. S. Pazzi, Luis J. D. Pazzi, and Adolfo P. Ordóñez, Buenos Aires, Argentina. - A device for injecting currents of hot or cold air or of disinfecting or curing fumes or gases into corn silos and other similar storing containers, for drying, ventilating or disinfecting the corn cobs or other grain or products contained therein is described.

1,633,301 (June 21, 1927; appl. Feb. 13, 1923). METHOD AND APPARATUS FOR TREATING SEED GRAIN. Sylvester J. Williams, Ritzville, Wash. - Cornelius Allbert, Ritzville, Wash. - Copper carbonate or other fungicidal powder for preventing smut is applied to grain and the coating of powder "fixed" on the grain by frictional treatment.

1,634,893 (July 5, 1927; appl. July 22, 1926). PURIFYING MECHANISM AND METHOD. Almond E. Wilson, Indianapolis, Ind. - A method and means of spraying by artificial force, a vaporous insecticide thru the product of a grain mill while the product is being manufactured and in motion thru such mill, is described.

1,648,538 (Nov. 8, 1927; appl. Nov. 23, 1922). MACHINE FOR TREATING SEED GRAIN. Claude C. Calkins, Heppner, Ore. - A machine adapted for treating grain with a powder, such as copper carbonate, to prevent formation of smut is described.



1,651,390 (Dec. 6, 1927; appl. Apr. 16, 1927). DUST-SEED-TREATMENT MACHINE. Francis C. Hersman, Normal, Ill. - This machine is designed for treating the seeds of cereals such as corn, wheat, barley or rye, as well as beans, peas and the like, with powdered material to render the seed or grain impervious to attack by parasites, fungus or bacteria.

1,655,144 (Jan. 3, 1928; appl. Apr. 22, 1925). GRAIN-TREATING MACHINE. Joseph Hallgarth and Earl E. Chandler, Elgin, Ore. - A machine for dusting grain seed with copper carbonate to prevent smut is described.

1,658,938 (Feb. 14, 1928; appl. Nov. 26, 1926). MACHINE FOR TREATING SEEDS FOR SMUT. Robert J. Owens, Minneapolis, Minn. - This machine is designed for coating seeds with a dry powder such as copper carbonate to prevent smut.

1,690,718 (Nov. 6, 1928; appl. Sept. 12, 1924). SEED-TREATING MACHINE. Claude C. Calkins, Spokane, Wash. - A seed treating machine is described wherein seed or grains for planting are treated or coated with a powder as a preservative against disease, such as smut, which attacks the seed or grain after planting.

1,694,442 (Dec. 11, 1928; appl. Sept. 16, 1926). SEED-DUSTING APPARATUS. Benjamin F. Gustafson, Redfield, S. Dak. - This invention relates to means for treating seed with a powdered chemical, such as copper carbonate to destroy and prevent fungous growth, such as smut.

1,696,048 (Dec. 18, 1928; appl. Apr. 21, 1926; in Australia, Nov. 23, 1925). MACHINE FOR THE PICKLING OF GRAIN. Francis H. McCormick and James P. Dwyer, Perth, Western Australia, Australia. - This invention relates to a machine either for the dry or wet pickling of grain and whereby such pickling is performed in a free and continuous manner so that the pickling agent is caused to intimately adhere to each grain.

1,697,875 (Jan. 8, 1929; appl. Feb. 11, 1927). GRAIN WASHER AND DRIER. Timothy C. Manning, Omaha, Nebr. - A machine adapted to remove dirt, smut spores, nematode gall dust and other injurious substances from wheat berries and thereby prepare the same for the subsequent operations of milling the grain into flour is described.

1,698,436 (Jan. 8, 1929; appl. Oct. 25, 1926). GRAIN-DUSTING APPARATUS. Harry O. Hendrickson, Homestead, Mont. - A machine for dusting grain with copper carbonate or other suitable material to prevent smut and other grain diseases is described.

1,707,698 (Apr. 2, 1929; appl. Sept. 4, 1926). SEED TREATING AND MIXING DEVICE FOR GRAIN DRILLS. Eldon R. Watkins, Arlington, Kans. - A device constructed for disposition upon the seed hopper of any conventional type of grain drill whereby the seed to be subsequently planted by the drill may be properly treated with a suitable chemical so as to prevent "smut" is described.



1,713,568 (May 21, 1929; appl. Apr. 20, 1927). FORCE-FEED SEED-TREATING MACHINE. Gus. L. Swenson, Colville, Wash. - A machine for the treatment of seed with powder or other substance is described.

1,733,314 (Oct. 29, 1929; appl. Sept. 13, 1928). SEED-TREATING APPARATUS. Curtis M. Phillips, Rudyard, Mont. - An apparatus designed for use in the treatment of grain or other seed with copper-carbonate or the like is described.

1,750,508 (Mar. 11, 1930; appl. June 23, 1928). METHOD FOR CONDITIONING GRAIN. John W. Cornelius, Kansas City, Mo. - General Mill Equipment Company, Kansas City, Mo. - A method for conditioning grain includes treatment of the moist grain with agents such as bleaching and smut spore destroying substances. Suitable apparatus is described.

1,756,246 (Apr. 29, 1930; appl. Dec. 22, 1927). GRAIN-CLEANING PROCESS AND MACHINE. Thomas E. Forster, Wichita, Kans. - Forster Manufacturing Company, Wichita, Kans. - A machine for removing smut, crease dirt, dust, and the like from previously threshed grain is described.

1,764,510 (June 17, 1930; appl. Feb. 17, 1927). GRAIN-TREATING MACHINE. Sampson J. Goodfellow, Regina, Saskatchewan, Canada. - Western Implements Limited, Regina, Canada. - A machine for treating grain with copper carbonate is described.

1,788,617 (Jan. 13, 1931; appl. Mar. 25, 1929). SEED-TREATING MACHINE. Claude C. Calkins, Spokane, Wash. - This machine is adapted for applying, by attrition, a powdered coating, e. g. copper carbonate, to seed grain such as wheat before planting to protect the seed against smut and other diseases after it is planted.

1,809,701 (June 9, 1931; appl. May 7, 1929). GRAIN CLEANING AND SEED TREATING APPARATUS. John W. Hoeffling and Philip M. Hoeffling, Chico, Calif. - This machine separates wheat from foreign seeds and from broken wheat and screenings and subsequently treats the wheat with copper carbonate or like substance to prevent smut.

1,837,321 (Dec. 22, 1931; appl. July 23, 1929). SEED TREATING MACHINE. William E. Ghent, Atlanta, N. Y. - Boggs Manufacturing Corporation, Atlanta, N. Y. - This machine is particularly adapted for treating seed potatoes, onions and the like with a fluid to destroy or repel all bugs, insects and the like which may attack the seed either before or after planting.

1,839,214 (Jan. 5, 1932; appl. Aug. 1, 1927). GRAIN WASHING AND DRYING MACHINE. David Geddes, Berkeley, Calif. - A horizontal grain washing and drying machine is described in which all smut, wild onion, dirt and the like are freed from the grain during operation.

1,892,763 (Jan. 3, 1933; appl. Feb. 8, 1930). GRAIN DRILL STERILIZER-MIXING ATTACHMENT. Melvin E. Gass, Colfax, Wash. - A grain drill attachment provides means for mixing a sterilizing powder such as copper carbonate with the grain in the drill hopper.

1,897,361 (Feb. 14, 1933; appl. Feb. 3, 1930). SEED TREATING MACHINE. Claude C. Calkins, Spokane, Wash. - This machine is designed for treating seed with smut-destroying powders such as copper carbonate, cerasan or semesan.



1,902,733 (Mar. 21, 1933; appl. July 19, 1930). GRAIN TREATING AND ELEVATING DEVICE. Hans M. Smestad, Bainville, Mont. - An apparatus which may be attached to the elevator of a combine or thresher for loading grain into a bin or wagon and for treating the grain for smut during the loading operation is described.

1,910,793 (May 23, 1933; appl. May 13, 1930). GRAIN CONDITIONER. Joseph L. Guinan, Omaha, Nebr. - This invention relates to grain conditioners and has for its object to provide a device wherein a continuous circulation of chemically laden air is maintained through a grain bin, and particularly adapted for elimination of weevil, bran bugs, parasites, grain lice, larvae, and other conditions under which it is necessary to treat grain.

1,914,341 (June 13, 1933; appl. June 18, 1930). PROCESS OF TREATING GRAINS. Lawrence W. Larsen, Marinette, Wis. - Ansul Chemical Company, Marinette, Wis. - A process for sulfurizing grains such as oats and barley, for the purpose of removing stain, must and mold, consists essentially in diffusing the grain by showering or streaming it into a bin or chamber, spraying it while in the diffused state with water at ordinary temperature and in predetermined amount to suitably moisten it, and either simultaneously or immediately afterwards spraying it with liquid sulfur dioxide in predetermined amounts. The amount of water used ranges from 1 to 3 percent of the weight of the grain and the amount of sulfur dioxide ranges from 0.05 to 0.50 pound per bushel of grain.

1,914,342 (June 13, 1933; appl. June 18, 1930; divided and filed Sept. 18, 1930). APPARATUS FOR TREATING GRAINS. Lawrence W. Larsen, Marinette, Wis. - Ansul Chemical Company, Marinette, Wis. - This apparatus is intended for use with the process described in U. S. patent 1,914,341.

1,926,621 (Sept. 12, 1933; appl. May 29, 1930). PORTABLE GRAIN CLEANING MACHINE. John W. Hoefling, Chico, Calif. - This apparatus cleans the grain and subsequently mixes with it powdered material for the prevention of smut.

#### ASSIGNEE INDEX

(Numbers refer to patents cited)

Albert, Cornelius, 1,633,301  
Anglo-American Mill Co., 1,372,511  
Ansul Chemical Co., 1,914,341; 1,914,342  
Boggs Manufacturing Corp., 1,837,321  
Donahue-Stratton Co., 1,320,408  
Forster Manufacturing Co., 1,756,246  
Fox, John, 1,409,144  
General Mill Equipment Co., 1,750,508  
Hoiland, Alfred, 1,312,647  
Western Implements Ltd., 1,764,510  
Wolf Co., 1,593,174

- - - - -



PATENTEE INDEX

Anderson, Harry Y. (See Anderson, Roy M.)  
Anderson, Roy M. and Anderson, Harry Y., 1,550,656  
Austin, Paul V., 1,377,743  
Baker, Robert E. and Jordan, Harry W., 1,509,280  
Bishop, Alfred J., 1,558,580  
Breen, Harold L., 1,396,621  
Burgett, Orr, 1,625,521  
Calkins, Claude C., 1,573,142; 1,616,783; 1,648,538; 1,690,718; 1,788,617;  
1,897,361  
Chambers, William S., 1,293,034  
Chandler, Earl E. (See Hallgarth, Joseph)  
Cornelius, John W., 1,750,508  
Dawson, Charles, 1,231,002; 1,400,664  
Dolter, Emile, 1,234,305  
Dwyer, James P. (See McCormick, Francis H.)  
Espeseth, Alfred, 1,573,694  
Forster, Thomas E., 1,756,246  
Fox, John, 1,218,250  
Gass, Melvin E., 1,892,763  
Geddes, David, 1,839,214  
Ghent, William E., 1,837,321  
Gollbach, Joseph, 1,623,001  
Goodfellow, Sampson J., 1,764,510  
Guinan, Joseph L., 1,910,793  
Gustafson, Benjamin F., 1,694,442  
Hallgarth, Joseph and Chandler, Earl E., 1,655,144  
Hanson, Johannes, 1,297,684  
Heishman, Joseph H., 1,254,008  
Hendrickson, Harry O., 1,698,436  
Herrman, Wenzel H., 1,324,312  
Hersman, Francis C., 1,651,390  
Hicks, Harold H., 1,324,048  
Hoefling, John W., 1,926,621  
Hoefling, John W. and Hoefling, Philip M., 1,809,701  
Hoefling, Philip M. (See Hoefling, John W.)  
Howson, Charles T., 1,372,511  
Hunt, Robert G., 1,593,174  
Iverson, Ludvig A., 1,382,981  
Jahn, Emil B., 1,498,379  
Jordan, Harry W. (See Baker, Robert E.)  
Lajack, Henry, 1,392,649  
Larson, Lawrence W., 1,914,341; 1,914,342  
Lawrence, Albert A., 1,409,144  
Lee, Ralph R. (See Miller, Carl P.)  
Leizert, Ezra N., 1,371,913  
Manning, Timothy C., 1,697,875  
Mauch, Wilhelm, Jr., 1,274,180  
McCormick, Francis H. and Dwyer, James P., 1,696,048  
McKinney, Clarence, 1,211,734  
Miller, Carl P. and Lee, Ralph R., 1,403,092

Nelson, Charles H., 1,244,761  
Ordoñez, Adolfo P. (See Pazzi, Anibal J. S.)  
Owens, Robert J., 1,658,938  
Pazzi, Anibal J. S., Pazzi, Luis J. D. and Ordóñez, Adolfo P., 1,630,308  
Pazzi, Luis, J. D. (See Pazzi, Anibal J. S.)  
Pearson, Miles E., 1,218,114  
Phillips, Curtis M., 1,733,314  
Phillips, Francis L., 1,327,444  
Pierson, Earl M. (See Pierson, John O.)  
Pierson, John O. and Pierson, Earl M., 1,363,053  
Puls, Louis J., 1,629,050  
Rasmussen, Raymond, 1,264,438  
Rickola, Arthur E., 1,344,148  
Saladiner, Joseph M., 1,458,854  
Smestad, Hans M., 1,902,733  
Smith, Lenious D., 1,313,027  
Steigmeyer, Frederick, 1,473,165  
Struble, Alfred, 1,312,647  
Swenson, Gus. L., 1,713,568  
Uiting, Henry, 1,279,791  
Von Hagen, Arnold C., 1,221,636; 1,237,425; 1,265,700  
Walstad, Thaddous C., 1,260,606  
Watkins, Eldon R., 1,707,698  
Weitman, Samuel A., 1,573,340  
Wheeler, Max A., 1,479,764  
Williams, Sylvester J., 1,633,301  
Wilson, Almond E., 1,634,893  
Wright, Elsie, 1,275,819